

in terms which distinguish over the art of record. Claims 26 and 27 have been added to assure Applicants of a full measure of protection of the scope to which they deem themselves entitled. Claims 1, 19, 20, 22, and 25 are independent.

Claims 1-25 were rejected under 35 U.S.C. § 102(b) as being anticipated by JP 3-45351 to Iwazawa.

Applicants submit that independent Claims 1, 19, 20, 22, and 25 are patentably distinct from the cited prior art for at least the following reasons.

Claim 1 is directed to a print apparatus capable of forming a color image by applying ink materials of plural colors in different amounts onto a print medium while scanning a recording head in two directions. Control means is included for applying plural ink materials for each pixel area to allow a gradation recording, the pixel area being a unit area for expressing thereon a primary color or a secondary color. The control means applies ink materials on a pixel area for expressing thereon the secondary color area so that dots of the secondary color may be formed on plural positions of the pixel area with making different the orders of application of ink materials of plural colors used for expressing the secondary color. The control means also conducts the gradation recording using a pattern of applying an ink material of relatively less amount on a diagonal position of the pixel area and a pattern of applying an ink material of relatively more amount on a diagonal position of the pixel area.

Iwazawa, as understood by Applicants, relates to a color printer which has a first delivery head group and a second delivery head group. In forward printing, only the first head group conducts a delivery action, and the order of delivering colors is A, B, C,

and D. In reverse printing, only the second head group conducts a delivery action. After the completion of the forward printing, recording paper is fed by the amount of N lines by a recording paper feed means, and an unprinted surface is disposed under the delivery head. In the reverse printing, the order of delivering colors is also A, B, C, and D. The inks are delivered in the same order in the forward and reverse printing.

Therefore, as can be seen from the above description, in the printer of Iwazawa, there are prepared nozzles for forward printing, and nozzles for reverse printing, and the nozzles are exchanged between forward and reverse scans. However, nothing has been found in Iwazawa that would teach or suggest a print apparatus which applies ink material of different amounts on a pixel area for gradation recording, as recited in Claim 1.

Furthermore, nothing has been found in Iwazawa that would teach or suggest a print apparatus which applies plural ink materials for each pixel area to allow a gradation recording, the pixel area being a unit area for expressing thereon a primary color or a secondary color, wherein ink materials are applied on a pixel area for expressing thereon the secondary color area so that dots of the secondary color may be formed on plural positions of the pixel area with making different the orders of application of ink materials of plural colors used for expressing the secondary color, as recited in Claim 1.

For at least these reasons, Applicants submit that Claim 1 is clearly allowable over Iwazawa.

Independent Claims 19, 20, and 22 recite features which are substantially similar to Claim 1, and are believed to be patentable for substantially similar reasons as discussed above in connection with Claim 1. For example, Claim 19 recites a print

apparatus having the feature wherein, in order to make the order of application of an ink material of a certain color out of ink materials of plural colors applied in at least one kind of amount onto a pixel area for expressing thereon a process color using ink materials of plural color to form the process color, symmetric with respect to an ink material of another color, at least the ink materials of the certain color are applied onto the pixel area.

Claim 25 is directed to a printing apparatus capable of forming a color image by applying ink materials of plural colors in different amounts onto a print medium while scanning a recording head. In the recording head, with respect to the ink material of at least one color, first and second arrays of recording elements, in which the recording elements for applying ink materials of different amounts are arranged with a predetermined pitch, are arranged in the direction of the scanning, and, in the first and second arrays of the recording elements, the recording elements for applying ink materials of a same amount are arranged with a displacement by the predetermined pitch in the direction of the array.

Nothing has been found in Iwazawa that would teach or suggest a printing apparatus having a configuration which defines an arrangement of pitch recording elements. For at least these reasons, Applicants submit that Claim 25 is clearly allowable over Iwazawa.

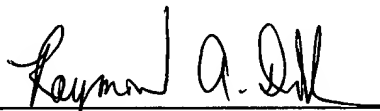
A review of the other art of record has failed to reveal anything which, in Applicants' opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims. Those claims are therefore believed patentable over the art of record.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

Applicants' undersigned attorney may be reached in our New York Office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address listed below.

Respectfully submitted,

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VERSION MARKED TO SHOW CHANGES MADE TO CLAIMS

1. (Amended) A print apparatus capable of forming a color image by applying ink materials of plural colors in different amounts onto a print medium while scanning a recording head in two directions,

[wherein, in order to make orders of application of an ink material of a certain color out of ink materials of plural colors applied in at least one kind of amount onto a pixel area of a secondary color to form the secondary color, symmetric with respect to an ink material of another color, at least the ink material of said certain color is applied plural times onto said pixel area] said apparatus comprising:

control means for applying plural ink materials for each pixel area to allow a gradation recording, said pixel area being a unit area for expressing thereon a primary color or a secondary color,

wherein said control means applies ink materials on a pixel area for expressing thereon the secondary color area so that dots of the secondary color may be formed on plural positions of the pixel area with making different the orders of application of ink materials of plural colors used for expressing the secondary color, and conducts the gradation recording using a pattern of applying an ink material of relatively less amount on a diagonal position of the pixel area and a pattern of applying an ink material of relatively more amount on a diagonal position of the pixel area.

19. (Amended) A print apparatus capable of forming a color image by applying ink materials of plural colors in different amounts onto a print medium while scanning a recording head in two directions,

wherein, in order to make [orders] the order of application of an ink material of a certain color out of ink materials of plural colors applied [onto] in at least one kind of amount onto a pixel area [of] for expressing thereon a process color using ink materials of plural color to form the process color, symmetric with respect to an ink material of another color, at least the ink [material] materials of said certain color [is] are applied [plural times] onto said pixel area, and

ink materials to be applied with relatively less amount are applied on diagonal positions of the pixel area, while ink materials to be applied with relatively more amount are applied on diagonal positions of the pixel area, different from the positions where the ink materials are applied with relatively less amount.

20. (Amended) A print method capable of forming a color image by applying ink materials of plural colors in different amounts onto a print medium while scanning a recording head in two directions, said method comprising:

a first step of applying an ink material of a certain color [in at least one kind of amount] for forming a secondary color in at least one kind of amount onto a pixel area [of] for expressing thereon said secondary color;

a second step of applying in said amount onto said pixel area an ink material of another color [in said amount onto said pixel area] for forming said secondary color in combination with said certain color, after the application of the ink material of said certain color; and

a third step of applying the ink material of said certain color in said amount onto said pixel area, after the application of the ink material of said another color,

wherein the ink materials are applied onto the pixel area so that dots of the secondary color may be formed at plural positions of the pixel area with making different the orders of application of the ink materials of plural colors for expressing the secondary color.

22. (Amended) A print method capable of forming a color image by applying ink materials of plural colors in different amounts onto a print medium while scanning a recording head in two directions, said method comprising:

a first step of applying an ink material of a certain color for forming a secondary color [in] onto a pixel area [of the secondary color and] for expressing thereon the secondary color and applying an ink material of another color for forming said secondary color in combination with the certain color, said ink materials being applied in the order named, in at least one kind of amount onto said pixel area; and

a second step of applying the ink material of said certain color and the ink material of said another color in an order symmetric with said order, in said amount onto said pixel area,

wherein a position within the pixel area where the ink material is applied in said first step and a position within the pixel area where the ink material is applied in said second step are on a diagonal line, and

ink materials to be applied with relatively less amount are applied on diagonal positions of the pixel area, while ink materials to be applied with relatively more amount are applied on diagonal points of the pixel area different from the positions where the ink materials are applied with relatively less amount.